

Solar Decathlon™

Amended Rules and Regulations

March 15, 2002

5.2. Event—Amended

5.2.1. Safety—Each team is responsible for the safety of its house, car, and team members. Passing Inspection or implementing changes suggested in the team's structural report does not release the team from any liability. All houses, cars, and support vehicles must be maintained and operated safely at all times. A team will be disqualified and withdrawn from the Event at any time if they operate in an unsafe manner.

5.2.1.1. Each house will be required to have smoke detectors per IRC2000 requirements and a fire extinguisher with a minimum Underwriters Laboratory (UL) rating of 2A-10BC. All battery system rooms or rooms containing a battery system enclosure must have a smoke detector that is either audible from outside the room or has a remote indicator that is monitored by the team.

5.2.1.2. Each house must be equipped with proper personal protective equipment (PPE) (a minimum of chemical resistant gloves, apron and eye protection) in order to service their battery bank and as protection from any other thermal, electrical, mechanical or fluid system that presents any sort of hazard.

5.2.1.3. Each house must be equipped with the proper spill clean up kits for their battery bank or fluid systems. All batteries, regardless of placement on a rack or otherwise, must have a spill containment system in compliance with UFC1997 6404.4 Spill Control and 6404.5 Neutralization or IFC2000 608.4 Spill Control and Neutralization

5.4. Electrical—Amended

5.4.1. Code Compliance—All houses must meet all applicable electrical requirements stated in the National Electric Code 1999 (NEC1999). Particular attention should be paid to Articles 690, 480, 445, 250, 400, 240 which references proper photovoltaic system design, storage batteries, generators, grounding, conductors & conductor ampacity ratings, overcurrent protection devices and warning labels, respectively. Specific alterations to the code requirements are included in Regulations—Event, Safety, Regulations—Electrical, Code Compliance, Battery Ventilation, Battery Stacking and Regulations—Energy Collection & Storage, Storage Batteries. Additional code requirements from UFC1997, IFC2000, IMC2000 and IBC2000 will supercede

NEC1999 requirements as noted. Teams are also encouraged to read this publication: Wiles, John C. (2001). *Photovoltaic Power Systems and the National Electric Code: Suggested Practices*. Sandia Report SAND2001-0674.

5.4.2. Battery Enclosures—Battery systems must be fully contained in enclosures or rooms that remain within the 800-ft.²-footprint. The cover must be locked so access to batteries inside the enclosure is limited to the team's decathletes. A battery system room will be permitted in lieu of a separate battery system enclosure if designed in accordance to UFC1997 Article 64: Stationary Lead-Acid Battery Systems or IFC2000 Section 608: Stationary Lead-Acid Battery Systems, as if the room contained corrosive liquids in excess of 100 gallons regardless of battery type.

5.4.3. Battery Ventilation—Battery system enclosures or rooms must be equipped with a passive or mechanical ventilation system per IFC2000 608.5 Ventilation, UFC1997 6404.6 Ventilation, or IMC2000 502.4 Stationary Lead-acid Battery Systems. Teams are required to provide either calculations or empirical evidence to show compliance. Such ventilation systems must exhaust or vent to the outdoors. The vent must be designed so wind cannot push hydrogen gas back down the vent. This requirement includes all battery types because any battery type will vent hydrogen gas under certain conditions.

5.4.4. Battery Stacking—Stacking the batteries is discouraged. If it is necessary to stack the batteries, a battery system rack must be used. The rack must meet the requirements of IBC2000 1621.3.13 Electrical Equipment Attachments and Supports. The rack must also meet the requirements of NEC1999 480-7 Racks and Trays. All racks containing flooded lead-acid batteries must provide 18 in. of clearance from the top of the battery or top of the battery post (whichever is greater) to the bottom of the next shelf for inspection and maintenance. All racks containing sealed batteries must provide adequate space for access with tools in order to verify tightness of terminal connections.

5.6. Energy Collection & Storage—Amended

5.6.3. Storage Batteries—Teams are allowed to use battery systems in their house and car for storage of solar-generated energy. The battery system for the car must be the car manufacturer's original equipment. Battery data submittal shall be based on the manufacturer's published specifications provided by the team. Batteries must be available in sufficient quantities to be accessible to all participating teams. The battery modules may not be modified in any manner, including the addition of electrolyte additives, case modification, or plate addition, removal, or modification. However, teams are permitted to add distilled water to vented (flooded) lead-acid batteries for maintenance purposes.

5.6.3.1. Primary Batteries—The use of primary (non-rechargeable) batteries is limited to smoke detectors only.

5.6.3.2. Secondary Batteries—The use of secondary batteries (rechargeable) for items such as laptop computers is permitted provided that all laptops or similar devices used for Contest purposes are to be recharged from the house electrical system.